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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,574	07/13/2005	Sang-Uk Kim	1032.006	4962

23598	7590	10/15/2007
BOYLE FREDRICKSON S.C. 840 North Plankinton Avenue MILWAUKEE, WI 53203		

EXAMINER	
PILKINGTON, JAMES	

ART UNIT	PAPER NUMBER
3682	

NOTIFICATION DATE	DELIVERY MODE
10/15/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@boylefred.com

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/516,574	KIM, SANG-UK	
	Examiner	Art Unit	
	James Pilkington	3682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 11 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-20 and 22-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 September 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the hub having a groove in at least one of a lower portion of the hub, an inner surface of the hub, and an inner surfaces of a bushing surrounding the hub (claims 4, 13, 22 and 33), the spindle shaft formed in one of a spherical, a semi-circular and a conical shape (claims 5, 14, 23 and 33), the aero dynamic pressure bearing being installed in a lower portion of the hub (claims 19 and 25) and wherein the sleeve is rotated/fixed together with hub (claims 26 and 27) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

2. Claims 26, 27, 28, 31, 32, and 34 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 20.

Claim 30 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 29.

When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 7, 8, 10, 15, 20 and 26-34 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re clm 2, it is not clear if the groove recited in line 2 is the same as the "plurality of grooves" recited in claim 1 line 5.

Claim 7 recites the limitation "the hub shaft" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Re clm 7, it is not clear how the fluid dynamic pressure bearing is rotated with respect to the hub shaft. The hub shaft is part of the bearing so how can it rotate with respect to itself? Does the applicant mean that the hub shaft rotates relative to the sleeve?

Re clm 8, it is not clear how the fluid dynamic pressure bearing forms a pressure between itself and the shaft when the shaft is part of the bearing. Does the applicant mean the pressure is between the sleeve and the shaft?

Re clm 10, it is not clear if the fluid dynamic pressure bearing is the same as that recited in claim 9. If it is not the same bearing where is it in the drawings? If it is the same bearing how does the bearing function if all of the components are rotatably installed in the base?

Re clm 15, it is not clear how the fluid dynamic pressure bearing rotates with respect to the spindle shaft when the spindle shaft is part of the fluid dynamic pressure bearing. Does the applicant mean that the shaft rotates relative to the sleeve of the bearing?

Re clms 20 and 26-34, it is not clear how the fluid dynamic pressure bearing is fixed with respect to the spindle shaft when the shaft is part of the fluid pressure bearing as claimed above.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3 and 5-8, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Liu, USP 5,969,448.

Liu discloses an aero and fluid hybrid dynamic pressure bearing comprising:

- An aero dynamic pressure bearing including a disk shaped bearing assembly (35) with a plurality of grooves (38 and 39) extending thereinto, wherein the aero dynamic pressure bearing forms an air layer that supports a load between a hub (16/27) and the bearing assembly (35)
- A fluid dynamic pressure bearing having a spindle shaft (11) with a plurality of grooves (at 42) extending thereinto, a sleeve (21) surrounding the spindle shaft (11), a thrust plate (19) cooperating with the end of the spindle shaft (11), and a void (44) formed between the spindle shaft (11) and the sleeve (21), wherein the void (44) is filled with fluid (50)
- Wherein the grooves (38 and 39) are formed in at least one of an upper horizontal surface (38 is upper surface) and a lower horizontal surface (39 is lower surface) of the bearing assembly (35)
- Wherein the fluid (50) has a certain viscosity and forms a discharging path for static electricity
- Wherein the spindle shaft (11) is a cylindrical shape
- Wherein during hub (16) operation or when the hub (16) is stopped the aero dynamic pressure bearing does not frictionally engage the hub (clearance 36)

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- Wherein the spindle shaft (11) passes vertically through the interior of the sleeve (21) and rotates with respect to the sleeve (21, shaft rotates with the hub)
- Wherein said fluid pressure bearing forms a fluid dynamic pressure between the sleeve (21) and the shaft (11)

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 4, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu '448.

Liu discloses all of the claim limitations as applied above. Liu also discloses a bushing (26).

Liu does not disclose that the grooves of the aero dynamic pressure bearing are formed on the lower portion of the hub, an inner surface of the hub or an inner surface of a bushing surrounding the hub.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to place the grooves on the hub or the bushing, since it has been held that rearranging of parts involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

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9. Claims 9, 10, 12-20 and 22-34, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu '448 in view of Ajello, USP 6,982,510..

Re clms 9, 10, 12, 14-20 and 22-34, Liu discloses an aero and fluid hybrid dynamic pressure bearing for use with a spindle motor which includes a base (19), a hub (16), a back yoke (17) supporting a ring shaped permanent magnet (18), and a stator (12) having a plurality of teeth (core 14) with coils (13) wound thereon, the aero and fluid hybrid dynamic pressure bearing comprising:

- An aero dynamic pressure bearing including a disk shaped bearing assembly (35) with a plurality of grooves (38 and 39) extending thereinto, wherein the aero dynamic pressure bearing forms an air layer that supports a load between a hub (16/27) and the bearing assembly (35)
- A fluid dynamic pressure bearing having a spindle shaft (11) with a plurality of grooves (at 42) extending thereinto, a sleeve (21) surrounding the spindle shaft (11), and a void (44) formed between the spindle shaft (11) and the sleeve (21), wherein the void (44) is filled with fluid (50)
- A bushing (26) provided between the magnet (18) and the bearing assembly (35)
- Wherein the shaft (11) of the fluid dynamic pressure bearing is rotatably installed in an upper portion of the base (19)
- Wherein the fluid (50) a forms a discharging path for static electricity
- Wherein the spindle shaft (11) is a cylindrical shape



- Wherein the spindle shaft (11) passes vertically through the interior of the sleeve (21) and rotates with respect to the sleeve (21, shaft rotates with the hub)
- Wherein said fluid pressure bearing forms a fluid dynamic pressure between the sleeve (21) and the shaft (11)

Liu does not disclose a thrust plate cooperating with an end of the spindle shaft in addition to the base.

Ajello teaches a thrust plate (522) cooperating with an end of the spindle shaft (510) in addition to the base (518).

It would have been obvious to one of ordinary skill in the art to use the thrust plate taught by Ajello to make the fluid dynamic bearing of Liu an independent member from the base for the predictable result of enabling easy removal and replacement of parts subjected to wear.

Claims 13 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu '448.

Liu in view of Ajello discloses all of the claim limitations as applied above.

Liu in view of Ajello does not disclose that the grooves of the aero dynamic pressure bearing are formed on the lower portion of the hub, an inner surface of the hub or an inner surface of a bushing surrounding the hub.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to place the grooves on the hub or the bushing, since it has been

held that rearranging of parts involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

### ***Response to Arguments***

10. The Applicant's amendment to the drawings overcomes the objections to the drawings and specification set forth in the prior office action. The new objections above were necessitated by the Applicant's amendment.

11. The Applicant's amendment to the claims overcomes the rejection of the claims under 35 U.S.C. First and Second Paragraph set forth in the prior office action. The new rejections under 35 U.S.C. Second Paragraph above were necessitated by the Applicant's amendment.

12. The Applicant's amendment to the claims renders the claims understandable to the extent that art can now be applied. The rejections under 35 U.S.C 102 and 103 were necessitated by the Applicant's amendment.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Pilkington whose telephone number is (571) 272-5052. The examiner can normally be reached on Monday-Friday 8:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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10/2/07

  
Thomas R. Hannon  
Primary Examiner